TCS **TeleCommunication Systems**

Enabling Convergent Technologies®

VoIP E9-1-1 Update and NPRM 05-196 Response

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Agenda

- Overview

- Current VoIP E9-1-1 Issues

- TCS Reply Comments to NPRM 05-196

Overview

TCS Offers a Wireless Perspective

Wireless Carriers

- Contractual relationships with over 46 wireless carriers

- Contracted to deploy E911 services to over 90 million subs for over 35 carriers (4 of top 5)

- Handling over 73,000 E9-1-1 calls daily

Local Exchange Carriers (LECs)

- Working relationships with all of the major LECs and many CLECs and smaller telecom providers

PSAPs

- Deployed wireless E911 in 42 states to over 4600 PSAPs

- Member of NENA, APCO and ComCARE

- Charter member of NENA Next Generation task force

- Former public safety officials on staff and in management

Applying Wireless Mobility to VoIP

VoIP Carriers

- **Vonage & Level(3) announcements recently made**
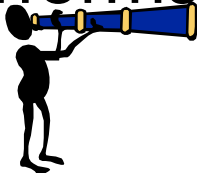- **Continue to work w/ deltaThree, SunRocket & others**

VoIP Solutions Being Deployed

- **I1 solution provided today**
  - Calls can be primary-routed to Administrative Lines
  - Calls can be primary-routed to TCS Response Center (RC)
    - TCS RC can delivery calls to Administrative Lines
    - TCS RC can deliver calls directly to First Responders (Fire, Police, Ambulance)
- **I2 Trials successfully completed**
  - Calls follow wireless model
  - Routing Instructions provided to VSP call server
  - Call-back number and Registered Location automatically delivered to PSAP

PSAP Outreach Efforts

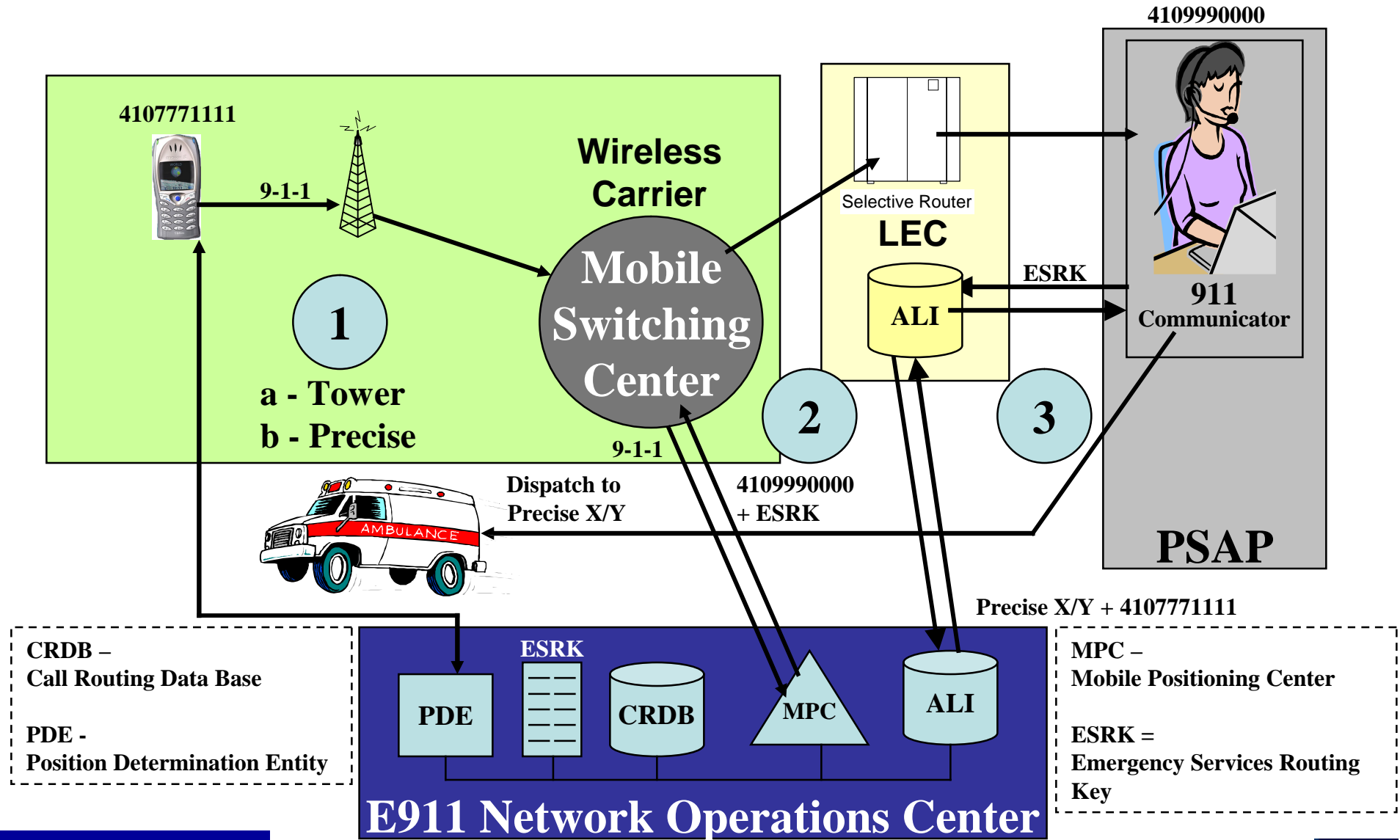- **Education & information exchange w/ 3000+ PSAPs nationwide**

Guiding Principles

- **Network Neutrality**
  - Apply rules equally to all players
  - Interconnection to the PSTN should be technically neutral
  - Proper guidance through performance metrics
- FCC oversight is required
- Focus should be on the consumer
  - Assume the consumer is clever
  - Assume the consumer is motivated by the pocketbook

Roles in Wireless E9-1-1 Approach

Network Approach

4109990000

4107771111

Wireless Carrier

9-1-1

Selective Router

LEC

Mobile Switching Center

ALI

ESRK

911 Communicator

1

a - Tower
b - Precise

2

3

9-1-1

Dispatch to Precise X/Y

4109990000 + ESRK

PSAP

Precise X/Y + 4107771111

E911 Network Operations Center

CRDB –
Call Routing Data Base

PDE -
Position Determination Entity

ESRK

PDE

CRDB

MPC

ALI

MPC –
Mobile Positioning Center

ESRK =
Emergency Services Routing Key

AMBULANCE

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Roles in VoIP E9-1-1 Approach

Network Approach

VoIP Service Provider (VSP)

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9-1-1

VoIP

1

Registration

Softswitch

Selective Router

LEC

ALI

EQRK

4109990000

911 Communicator

2

9-1-1

4109990000 + ESQK

3

AMBULANCE

Dispatch to Registered Location

PSAP

MSAG or Civic address + 4107771111

CRDB – Call Routing Data Base

Register- Location Registration Data

ESQK

Register

CRDB

VPC

ALI

VPC – VoIP Positioning Center

ESRK = Emergency Services Query Key

E911 Network Operations Center

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Roles in VoIP E9-1-1 Approach

Network Approach

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VSP **VSP Backbone**

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9-1-1

Selective Router

LEC

VoIP

1

Softswitch → **Softswitch**

TDM Gateway

Registration

9-1-1

EQRK

ALI

2   **3**

911 Communicator

4109990000 + ESQK

AMBULANCE

PSAP

Dispatch to Registered Location

MSAG or Civic address + 4107771111

CRDB –
Call Routing Data Base

Register-
Location Registration Data

ESQK

Register   **CRDB**   **VPC**   **ALI**

VPC –
VoIP Positioning Center

ESRK =
Emergency Services Query Key

E911 Network Operations Center

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Current

VoIP E9-1-1

Issues

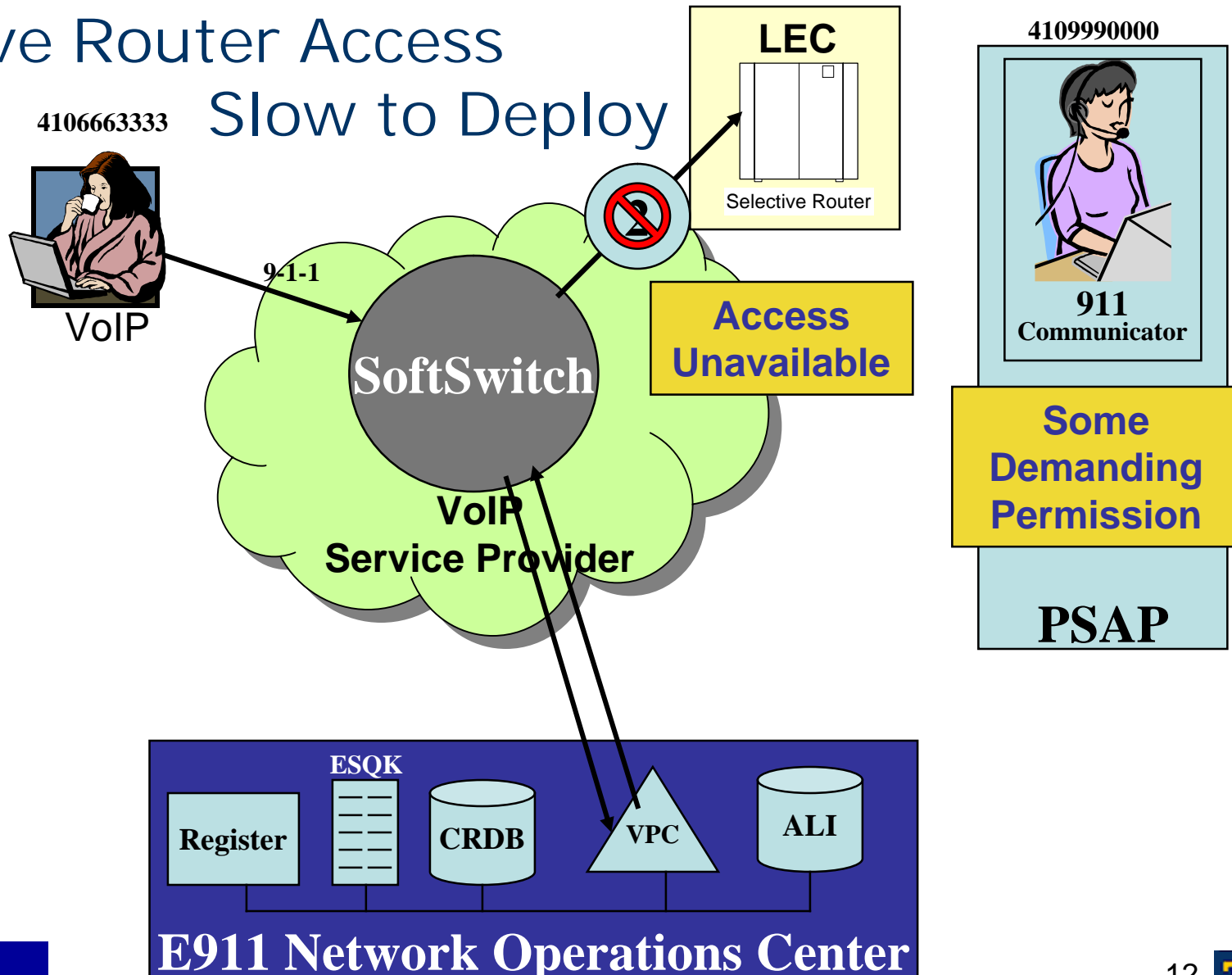# Greatest Technical Challenge - Location

- **Numerous techniques being explored**

  - Self registration

- WiFi Registration

  - Skyhook Wireless

  - Port discovery

    - Redsky, Qovia, eTelemetry

  - WiFi triangulation

  - Potential for GPS in the handset or Terminal Adapter

**Marketplace is continuing to innovate
Too early to recommend one solution**

Key Issues Impeding VoIP E9-1-1

Selective Router Access

Slow to Deploy

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VoIP

9-1-1

LEC

Selective Router

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911 Communicator

Access Unavailable

Some Demanding Permission

PSAP

SoftSwitch

VoIP Service Provider

E911 Network Operations Center

ESQK

Register | CRDB | VPC | ALI

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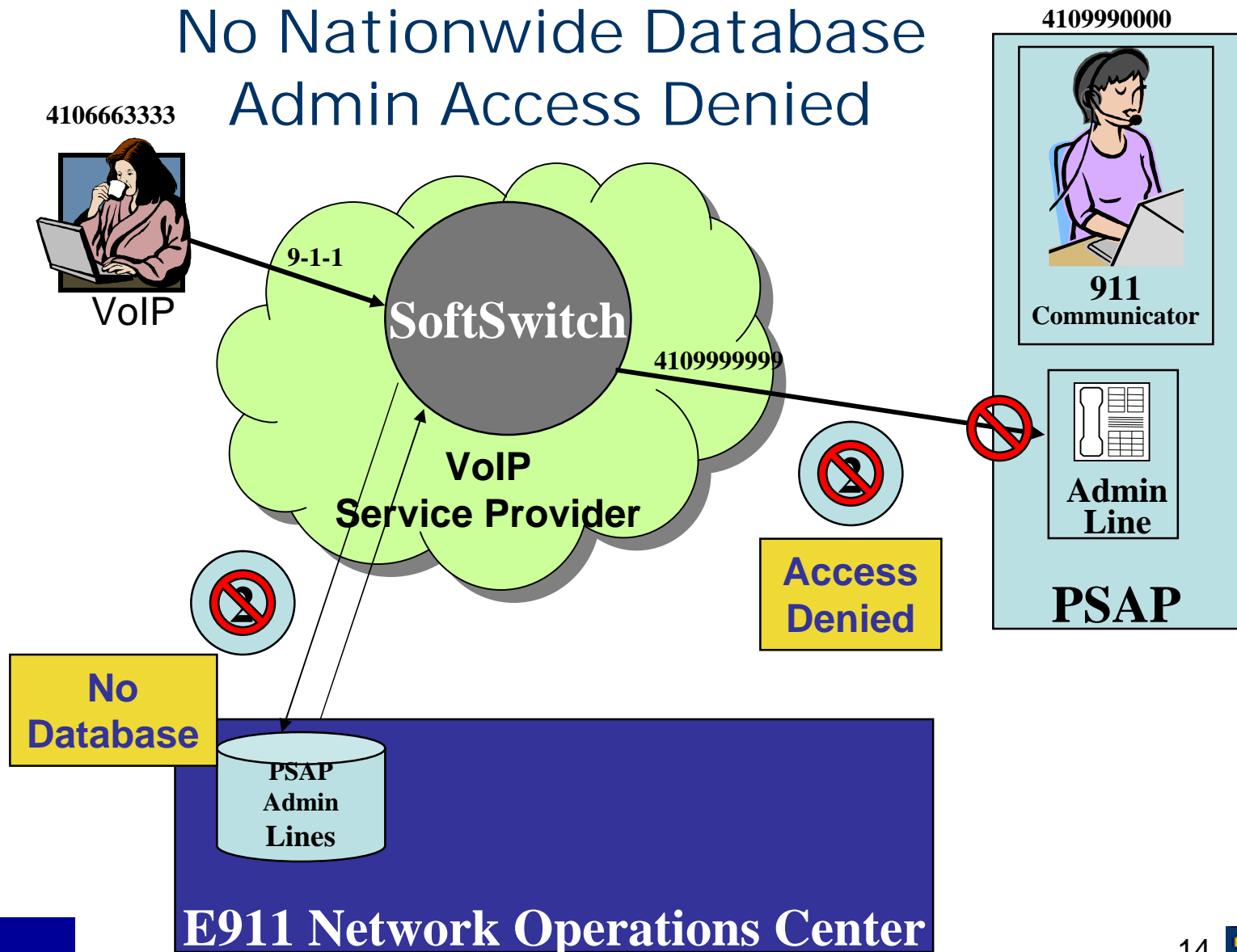
Selective Router Access Must Be Allowed

- **Auto Info Delivery requires Selective Routers**
  - Router access is primarily controlled by the LECs
  - Most LECs have been cooperative in allowing access to selective routers, but delays are occurring due to:
    - Some LECs require PSAP authorization before allowing trunk installation to selective routers.
    - Routine ordering and installation can take several weeks.
    - LECs have no deployment mandates for VoIP competitors
    - Costs are much higher than wireless

- **FCC Order Anticipated Infrastructure Available**
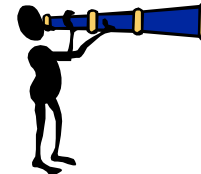
Even if access is granted, there will be a time of transition

PSAP Admin Access Is Needed in Interim

No Nationwide Database
Admin Access Denied

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9-1-1

VoIP

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SoftSwitch

911
Communicator

4109999999

VoIP
Service Provider

Admin
Line

**Access
Denied**

PSAP

**No
Database**

PSAP
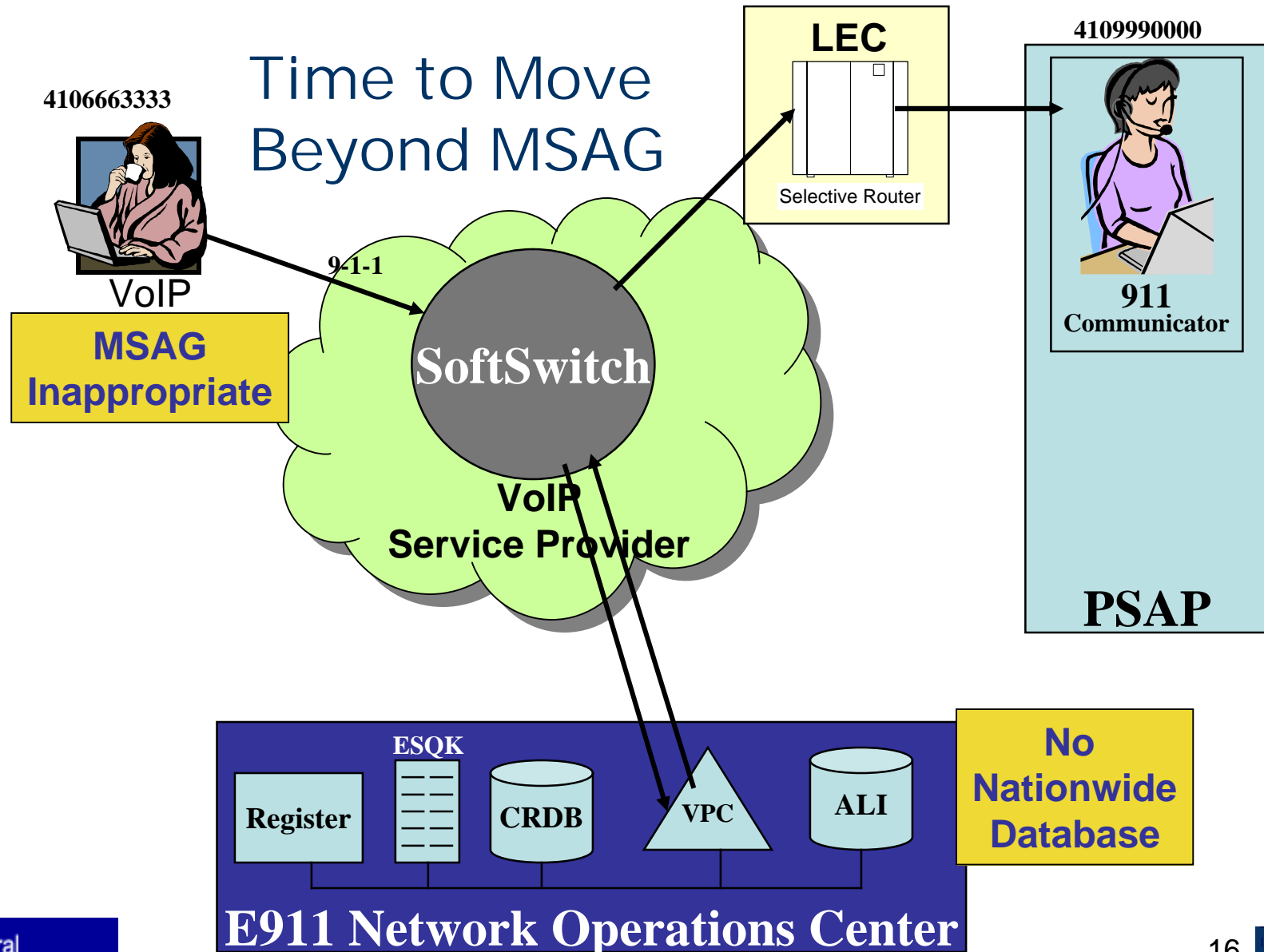Admin
Lines

E911 Network Operations Center

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PSAP Admin Line Access Needed in Interim

- **Interim solutions will be necessary**
  - Access to Selective Routers will take time
    - Regulatory issues need to be sorted out
    - Business issues (cost) will likely be negotiated
    - Technical issues (establishing connections) will take time
  - Public Safety does not support granting access
    - Administrative lines not staffed at same levels
    - Location is not automatically delivered – seconds lost!
    - Difficult to build a proper nationwide PSAP database
  - If 911 calls cannot be completed, lives will be at risk

**Public Safety must believe
this is interim**

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Need Nationwide MSAG (or Replace)

Time to Move
Beyond MSAG

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VoIP

MSAG Inappropriate

9-1-1

SoftSwitch

VoIP Service Provider

LEC

Selective Router

4109990000

911 Communicator

PSAP

ESQK

Register | CRDB | VPC | ALI

No Nationwide Database

E911 Network Operations Center

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Need Nationwide MSAG (or Replace)

- **MSAG is an antiquated location solution**
  - Data is fragmented
    - Controlled at the local level
    - Many locations do not have an appropriate address
      - E.g., corporate campus locations between buildings
  - Over 35% of E9-1-1 calls do not provide MSAG today
  - Civic Addresses may make more sense
    - Can reverse map XY coordinates to civic
  - Need Public Safety's concurrence to replace MSAG
  - Need Public Safety's help to build replacement

TCS Reply Comments

To NPRM 05-196

NPRM Comments

- **Apply rules to all VSPs**
- **Network neutrality should guide oversight**
- **Assist innovation in location development**
- **Apply rules to VSPs terminating calls**
- **Other provisions are recommended**
- **Reporting requirements recommended**
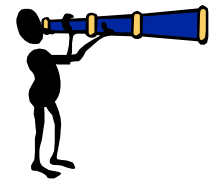
Apply Rules to All VSPs

- **Simple termination rule should be applied**
  - Can user terminate calls to PSTN?
  - Could the user use service for all terminations

- **Rules should apply to future technologies**
  - Avoid future problems by establishing rules now
  - Softphones & video phones are coming

911 Tariffs Inhibit VoIP

- 911 Tariffs are bundled in ways that create artificial barriers to competition

- Tariff reform would facilitate competition for the following services:
  - ALI
  - Selective Routing
  - Trunking

- Competition improves technology and reduce cost

Network Neutrality Should Guide Oversight

- **VSPs need same access as wireless/CLEC**
- **Must have access to all elements**
  - ALI, Selective Routers, Query Keys, Data Entry
- **Neutrality encourages participation**
  - New technologies will remake public safety
    - End-to-end data connectivity
    - Other information elements delivered (pictures, video, data)
  - PSAPs have varying levels of needs and sophistication
- **Establish performance metrics**
  - Location accuracy, time to deliver call/data

Assist Innovation in Location Development

- **Numerous techniques being explored**
  - Self registration
  - WiFi Registration
    - Skyhook Wireless
  - Port discovery
    - Redsky, Qovia, eTelemetry
  - WiFi triangulation
    - E911 Institute company
  - Potential for GPS in the handset or Terminal Adapter
- **Focus on requirements, not technology**
  - Same requirements for all technologies
  - Establish baseline requirements before mandating implementation.

Apply Rules to VSPs Terminating Calls

- **Consumers will rely upon termination services**
  - Configure a service in clever ways
    - WiFi phones that work anywhere in the house
    - Computers networked within the home to provide telephony
  - Consumers disconnect services they do not use

- **Consumers will mix and match**
  - Use termination service from one VSP
  - Use origination service from another VSP
- **Wireless carriers deliver calls w/o callback numbers; so should VSPs.**

Other Provisions Are Recommended

- **Continue to avoid regulating use of MSAG**
  - MSAG is a local requirement
    - Some PSAPs will accept civic addresses
  - MSAG is often not provided
    - Over 70% of wireless calls are Phase II
    - Phase II does not deliver MSAG-valid addresses
  - No nationwide source of MSAG exists
  - Consumers do not understand MSAG
- **Moving to Mobile VoIP complicates location**
  - WiFi & WiMax will create Mobile VoIP scenarios
  - Self registration techniques will not work
- **Location requirements should be consistent**
  - Wireless VoIP or CMRS should have similar metrics
- **Phased compliance approaches might be warranted**

Reporting Requirements Recommended

- **VSPs have mandate to deploy service, but lack authority over almost all of the necessary entities that control the deployment process.**

- **Deployment reports would guide waivers**
  - Date of PSAP contact
  - Date PSAP grants permission (if needed)
    - PSAP might have unique requirements
  - Date PSAP completes deployment activities
  - Date Selective Router is interconnected
  - Date ALI is interconnected
  - Date everything is ready to test
  - Date testing is complete

Questions

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